approximately 145 seconds. Subsequently, the etching process is finished after approximately 200 seconds. Generally, the shoulder portion 84a (at a corner portion of either right or left upper portion of the gate electrode) of the silicone nitride film 84 is readily reduced, and increasing the selection ratio at the shoulder portion 84a of the silicone nitride film 84 and the oxide film 83 is extremely difficult. However, in accordance with the condition of the present embodiment, a relatively high value, such as approximately 20, was obtained for the selection ratio of the reduction at the shoulder portion 84a of the silicone nitride film 84.

B10 cont

IN THE CLAIMS

Please amend claims 1-10, 12-14, and 16-18 as follows:

1. (Amended) A dry etching method comprising the steps of,

preparing a semiconductor wafer which comprises a semiconductor body, a plurality of gate electrodes formed on a main surface of said semiconductor body, a nitride film formed to cover said gate electrodes on said main surface, an oxide film formed to cover said nitride film on said main surface, and a mask film having a hole pattern formed on said oxide film, said hole pattern exposing a surface portion of said oxide film located between said gate electrodes;

B11

Sub D7

disposing said wafer in an etching treatment chamber;

generating electromagnetic waves and a magnetic field in an etching treatment chamber under vacuum,

generating plasma by electron-cyclotron resonance, and

SUD C1

etching said surface portion of said oxide film in said hole pattern in said etching treatment chamber, wherein

B14 C1

a distance between an antenna which is arranged in said etching treatment chamber and injects the electromagnetic waves, and said wafer is set at a value in the range from 30 mm to 100 mm,

the frequency of said electromagnetic waves is set at a value in the range from 300 MHz to 600 MHz,

a magnetic field gradient is set,

two kinds of electronic temperature regions are generated between said antenna and the wafer, and

an etching treatment is performed in a condition, that a gas pressure in said etching treatment chamber is in the range from 0.1 Pa to 4 Pa.

2. (Amended) A dry etching method as claimed in claim 1, further comprising the steps of:

introducing a gas consisting of at least carbon and fluorine into said etching treatment chamber,

generating F (fluorine radicals) and ions corresponding to CF_2 in said plasma, each amount of which is independent from each other, and

performing said etching treatment.

Sub C1

3. (Amended) A dry etching method as claimed in claim 2, further comprising the steps of:

introducing a gas consisting of at least carbon and fluorine into said etching treatment chamber,

determining power of a high frequency power source for generating said high electromagnetic waves, and

performing said etching treatment.

B11 cont

4. (Amended) A dry etching method as claimed in claim 1, further comprising the steps of:

generating electromagnetic waves and a magnetic field in said etching treatment chamber,

generating plasma by electron-cyclotron resonance (ECR), and

performing said etching treatment.

5. (Amended) A dry etching method as claimed in claim 1, further comprising the steps of:

introducing a gas consisting of at least carbon and fluorine into said etching treatment chamber,

generating electromagnetic waves and a magnetic field in said etching treatment chamber,

generating plasma by electron-cyclotron resonance (ECR),

determining a position of ECR,

generating F (fluorine radicals) and ions corresponding to CF_2 in said plasma, each amount of said F and said ions being independent from each other, and

performing said etching treatment.

6. (Amended) A dry etching method as claimed in claim 1, further comprising the steps of:

introducing a gas consisting of at least carbon and fluorine into said etching treatment chamber with a pre-determined flow rate, and

performing said etching treatment.

7. (Amended) A dry etching method as claimed in claim 1, further comprising the steps of:

generating F (fluorine radicals) and ions corresponding to CF_2 in said plasma, each amount of said F and said ions being independent from each other, in correspondence to an etching process of insulating film, and

performing said etching treatment.

8. (Amended) A dry etching method comprising the steps of:

preparing a wafer which comprises a substrate, a plurality of gate electrodes formed on a main surface of said substrate, a first film containing nitrogen formed to cover said gate electrodes on said main surface, a second film containing oxygen formed to cover said first film on said main surface, and a mask film having a hole pattern formed on said second film, said hole pattern exposing a surface portion of said second film located between said gate electrodes;

B4 Cont

disposing said wafer in an etching treatment chamber;

Sub C3

introducing a gas consisting of at least carbon and fluorine into said etching treatment chamber under a reduced pressure,

generating electromagnetic waves and <u>a</u> magnetic field in said etching treatment chamber,

generating plasma by electron-cyclotron resonance, and

performing an etching treatment with said wafer, wherein

a distance between an antenna, which is arranged in said etching treatment chamber and injects the electromagnetic waves, and said wafer is set at a value in the range from 30 mm to 100 mm,

a magnetic field gradient is controlled by setting the frequency of said electromagnetic waves at a value in the range from 300 MHz to 600 MHz,

Sub C3

a generation ratio of CF_2/F is controlled by varying two kinds of electronic temperature regions between said antenna and said wafer, and

an etching treatment for selectively etching said second film is performed.

B11 cont

9. (Amended) A dry method as claimed in claim 8, wherein

said etching treatment is performed in a manner that an electronic temperature around said wafer is decreased in accordance with elapsing of the etching time corresponding to the etching treatment for contact holes of said wafer.

10. (Amended) A dry etching method comprising the steps of:

preparing a wafer which comprises a substrate, a plurality of gate electrodes formed on a main surface of said

Sub C4

substrate, a first film containing nitrogen formed to cover said gate electrodes on said main surface, a second film containing oxygen formed to cover said first film on said main surface, and a mask film having a hole pattern formed on said second film, said hole pattern exposing a surface portion of said second film located between said gate electrodes;

disposing said wafer in an etching treatment chamber;

Sub 27

introducing a gas consisting of carbon and fluorine into said etching treatment chamber under vacuum,

generating electromagnetic waves and a magnetic field in said etching treatment chamber,

B11 cont

generating plasma by electron-cyclotron resonance, and

performing an etching treatment with said wafer, wherein

a distance between a wafer facing plane, which is arranged in said etching treatment chamber, and said wafer is set at a value in the range from 30 mm to 100 mm,

a magnetic field gradient is determined by setting the frequency of said electromagnetic waves at a value in the range from 300 MHz to 600 MHz,

two kinds of electronic temperature regions are generated between said wafer facing plane and said wafer, and

B11 Cont

an etching treatment is performed in a condition, that a gas pressure in said etching treatment chamber is in the range from 0.0 Pa to 4 Pa.

B12

12. (Amended) A dry etching method as claimed in claim 11, wherein

two kinds of electronic temperature regions are generated between said wafer facing plane and said wafer,

radicals and ions contributing to said etching treatment in plasma are generated, each amount of said radicals and said ions is independent from each other, and

said etching treatment is performed.

13. (Amended) A dry method as claimed in claim 10, wherein

electromagnetic waves and magnetic field are generated in said etching treatment chamber,

plasma is generated by electron-cyclotron resonance (ECR),

a position of ECR is determined, and

said etching treatment is performed.

14. (Amended) A dry etching method as claimed in claim 13, wherein

a gas consisting of at least carbon and fluorine is introduced into said etching treatment chamber,

B12 cont

two kinds of electronic temperature regions are generated between said wafer facing plane and said wafer,

F (radicals) and ions corresponding to CF_2 in plasma are generated, each amount of said radicals and said ions is independent from each other, and

Sub B7

said etching treatment is performed.

16. (Amended) A dry etching method as claimed in claim 14, wherein

F (fluorine radicals) and ions corresponding to CF_2 in said plasma are generated, each amount of said F and said ions is independent from each other, in correspondence to an etching process of the oxide film, and

B13

Said etching treatment is performed.

Sub C6

17. (Amended) A dry etching method comprising the steps of:

preparing a semiconductor wafer which comprises a semiconductor body, a plurality of gate electrodes formed on a main surface of said semiconductor body, a nitride film formed to cover said gate electrodes on said main surface, an oxide

film formed to cover said nitride film on said main surface, and a mask film having a hole pattern formed on said oxide film, said hole pattern exposing a surface portion of said oxide film located between said gate electrodes;

disposing said wafer in an etching treatment chamber;

generating electromagnetic waves and magnetic filed in said etching treatment chamber,

generating plasma by electron-cyclotron resonance in said etching treatment chamber, and

performing an etching treatment with said wafer, wherein

B13 cont

a distance between a wafer facing plane, which is arranged in said etching treatment chamber, and said wafer is set at a value in the range from 30 mm to 100 mm,

a magnetic field gradient is determined by setting the frequency of said electromagnetic waves at a value in the range from 300 MHz to 600 MHz,

the generation ratio of CF_2/F is controlled by making two kinds of electronic temperature regions, which are generated between said wafer facing plane and said wafer, variable by controlling the magnetic field gradient, and

the etching treatment for selectively etching said nitride film is performed.

18. (Amended) A dry etching method comprising the steps of:

preparing a wafer which comprises a substrate, a plurality of gate electrodes formed on a main surface of said substrate, a first film containing nitrogen formed to cover said gate electrodes on said main surface, a second film containing oxygen formed to cover said first film on said main surface, and a mask film having a hole pattern formed on said second film, said hole pattern exposing a surface portion of said second film located between said gate electrodes;

disposing said wafer in an etching treatment chamber;

B13 cont

introducing a gas consisting of at least carbon and fluorine into said etching treatment chamber so as to maintain a gas pressure in said etching treatment chamber,

Sub C4

generating plasma by electron-cyclotron resonance in said etching treatment chamber, and

performing an etching treatment with a wafer, wherein

a distance between a wafer facing plane, which is arranged in said etching treatment chamber, and said wafer is set at a value in the range from 30 mm to 100 mm,

each of frequencies of a high frequency power source for generating first electromagnetic waves and a high